Maynooth University
National University of Ireland Maynooth

Ollscoil Mhá Nuad

Maynooth University

QUALITY IMPROVEMENT AND ASSURANCE

PEER REVIEW GROUP REPORT

DEPARTMENT OF THEORETICAL PHYSICS

ACADEMIC YEAR 2018/19

Date 07 March 2019

Contents

1. Introduction

The quality review of the Theoretical Physics Department was carried out from 5 until 7 March 2019. Theoretical Physics is one of the smallest academic departments at Maynooth University with just 6 permanent members of academic staff and one administrator. It is part of the Faculty of Science and Engineering.

In preparation for the review the Department compiled a comprehensive 101-page self-assessment report. The schedule for the review was organised by the Quality Office of Maynooth University.

The review went very well; all organisational matters went smoothly. The Peer Review Group was given all access and information it required.

2. Peer Review Group Members

Name	Affiliation	Role
Professor Claudia Eberlein	Loughborough University	Chair & External Assessor
Professor Poul Damgaard	Niels Bohr Institute	External Assessor
Professor Peter McNamara	Maynooth University	Internal Assessor
Dr Bernie Grummell	Maynooth University	Internal Assessor

3. Timetable of the site visit

Date: Tuesday 5th March		
Time	**Description**	**Venue**
19:00	Convening of the Peer Review Group. Briefing by: Aidan Mulkeen, Vice President Academic and Registrar and Professor Ronan Farrell, Faculty Dean PRG agrees a Chair, and discuss the visit Identification of any aspects requiring clarification or additional information Dinner for members of the Peer Review Group, University Executive Member and Faculty Dean	Booked Carton House Hotel at 7pm for 6 people Aidan Mulkeen Ronan Farrell Poul Damgaard Claudia Eberlein Peter McNamara Bernie Grummell
Date: Wednesday 6th March		
Time	**Description**	**Venue**
8:30- 9:00	Convening of Peer Review Group	Council Room
9:00-10:00	Group meeting with all Department staff (Head of Department recused)	Council Room
10:10-10:45	Dr Jon Ivar Skullerud, Head of Department	Council Room
10:45-12:00	Tour of facilities of Department & refreshments, escorted by HOD	Department
12:00-12:30	Dr Joost Slingerland, Lecturer	Council Room

12:30- 13:00	Professor Peter Coles	Council Room
13:00 14:00	Working Lunch	Reserve Pugin Hall/ Table with service for Quality/4 people
14:00- 14:30	Ms Suzie Duffy/Departmental Administrator	Council Room
  14:30 15:00 15:00- 16:00	**Meet with Students:** Postgraduate Students (7) Undergraduate Students (12)	Council Room
16:00- 16:30	Break	Council Room
  16:30- 16:45 16:45- 17:00	**External Stakeholder/Phone Calls** Sinead Ryan, Trinity College Dublin (collaborator) Denjoe O'Connor, Dublin Institute for Advance Studies (collaborator)	Council Room
17:15- 17:45	PRG meeting – identification of any areas for clarification and finalisation of tasks for following day	Council Room
19:00	PRG private working dinner	**Booked Carton House Hotel at 7.00pm for 4 people**

Date: Thursday 7th March		
Time	**Description**	**Venue**
9:00-9:30	Convening of Peer Review Group	Council Room
9:30-10:00	Professor Ronan Farrell, Faculty Dean	Council Room

10:00-10:30	Professor Anthony Murphy, HOD Experimental Physics Professor Stephen Buckley, HOD Mathematics and Statistics	Council Room
10:30-11:00	**Occasional Staff** Dr Paul Watts and Dr John Brennan	Council Room
11:00-11:15	**External Stakeholder/Phone Calls** Professor JC Desplat, Irish Centre for High End Computing (collaborator)	Council Room
11:15-11:30	Refreshments	
11:30-12:00	Professor Brian Dolan	Council Room
12:00-12:30	Dr Jiri Vala, Senior Lecturer	Council Room
12:30-13:00	Dr Masud Haque, Lecture	Council Room
13:00-14:00	Working Lunch	Pugin Hall/Reserved Table with service for Quality, 4 people
14:00-16:30	Preparation of Exit Presentation	Council Room
16:30-17:00	Exit presentation to all departmental staff, made by the Chair of the PRG, summarising the principal commendations and recommendations of the Peer Review Group	Council Room
17:00	Refreshments and Exit of the PRG	Council Room

The timetable was entirely appropriate for the review and worked very well. All timings were accurate and the panel stuck to them within 5 minutes.

4. Peer Review Methodology

4.1 Site Visit

The panel visited the Department on the morning of 6 March and had the opportunity to see the working environment of the Department as well as speak to staff and students informally. The panel was satisfied with having seen all important aspects of the Department's site and being able to interact with its users.

4.2 Preparation of the Peer Review Group Report

The main points of the summary and all commendations and recommendations were agreed by the panel during its preparation of the exit presentation on the afternoon of 7 March. On the basis of that the Chair of the panel drafted the report which was then edited and contributed to by all panel members.

All panel members agreed on the final version by communicating by e-mail.

5. Overall Assessment

5.1 Summary Assessment of the Department

The Department's main strength is its excellent research performance. This is also reflected in its high-quality PhD training provision. Another strength is its vigorous culture of communicating research of undergraduates, postgraduates and faculty, for example through posters throughout the communal areas of the Department. This encourages an atmosphere of research activity, communication of research outcomes, and collaboration. The Department's main challenge is the high teaching-load due to its small faculty size but breadth of modules taught and multiplicity of programme offerings. Opportunities include more collaboration on shared teaching with neighbouring Departments, in particular Experimental Physics and Mathematics & Statistics. Another potential but challenging opportunity is increased student recruitment. Larger class sizes would enable the Department to increase its operating budget overtime and also make its teaching more efficient through enabling greater specialisation of teaching and reducing the number of modules taught by each member of faculty. Threats include persistent investment of time and effort into under-recruiting programmes, e.g. current MSc programmes or the continued running of all computing services at Departmental level. There is room for development in the documentation of the teaching and learning environment: module descriptions, learning outcomes, and opportunities for learning support should be consistently documented across all modules.

5.2 Self-Assessment Report

The self-assessment report was well written and provided comprehensive coverage on all aspects of the Department's work and governance. Its messages were very clear, and the report was well structured so that information was easy to locate. There was some repetition of some information in some parts of the appendices, a perhaps inevitable consequence of the large amount of work involved in compiling the report by a whole team.

As far as the Peer Review Group could ascertain the report was completely accurate and truthful. All staff members had been engaged in its preparation, and all of them were well informed about its contents.

6. Findings of the Peer Review Group: Commendations and Recommendations

6.1 Overview

The Department of Theoretical Physics is a very small Department but one of exceptional research strength and one that provides excellent teaching and learning for its students. It collaborates well with neighbouring Departments, especially Experimental Physics and Mathematics and Statistics. Recruitment of undergraduate students is fluctuating and partially constrained by overall recruitment constraints at Faculty-level that are due to lab space availability in other disciplines.

The Department's small size facilitates easy informal interaction among staff and between staff and students. The atmosphere is generally very collegial and students really appreciate this. However, on occasion this informality bears risks, most importantly due to a few instances of absent written information for students and staff. Apart from inefficiency, the scarcity of written policies or resources could also potentially be a problem for students that are, due to personality or circumstances, reluctant to seek help and support by speaking in person with members of faculty or the administrator.

At the same time, the Department's small size is a disadvantage when it comes to the distribution of teaching workload; staff have much higher teaching loads than would normally be expected at comparable institutions elsewhere. In view of this very high teaching load, it is all the more commendable that the quality and quantity of the Department's research output is exceptionally high.

Some female students commented that they would like to interact with more female teaching and research staff. The current composition of staff and research students gives the students too few opportunities to connect with female role models, though opportunities through female visiting researchers could probably be exploited more, until female staff and PhD students can be recruited.

The Department's resources and facilities are mostly adequate, with the exception of its PC suite which requires updating to a less–maintenance intensive Linux distribution and ongoing maintenance by a part-time Computer Technician as already agreed by the Faculty and University.

The Department is visible nationally and internationally due to its world-class research output. International engagement through conference attendance is limited due to budget constraints. The Department continues to try and attract external research funding from a variety of sources in order to ameliorate this. Furthermore, it makes good use of its existing international network to recruit strong PhD students. Growth of student numbers might further help to increase operating budgets to support research travel.

The Particle Physics Master classes are examples of the excellent outreach efforts of the Department and further work along such lines might help with attracting more under-graduate students.

The Peer Review Group was not given the Peer Review Group Report of the last quality report; as this was 10 years ago it would probably been of very little use since long outdated. However, the Department provided a detailed list of changes to teaching provisions since the last review, and these seemed all appropriate and well documented.

6.2 Commendations

Research

1. The Department has a very strong and distinctive research profile.
2. The Department's research covers a remarkably wide range of sub-fields of Theoretical Physics and there is an enduring commitment to maintaining that breadth.
3. The Department delivers research of world-class standard, a remarkable achievement in view of its very high teaching load.
4. The Department has been very successful in attracting research funding despite the very challenging funding environment in this area.
5. The Department fosters an impressive research culture, for example with regular seminar series that are inclusive to all staff and all students from first-year undergraduates and upwards.
6. The Department has an excellent record of successful public engagement activities that are connected to high-level research.
7. The Department's hiring policy is based on quality and is open to a wide range of sub-fields of Theoretical Physics.

Teaching and Learning

8. The whole Department shows enthusiastic engagement with its widely ranged undergraduate offerings.
9. There is personal interaction with students at all levels, undergraduates, Masters, and PhD students; all members of the Department are very approachable for all individuals.
10. The Department provides summer research opportunities for undergraduate students through the Maynooth University SPUR programme and use these as a vehicle to enthuse students about Theoretical Physics as a subject for study and research. The Department has taken own initiative and resources to increase funding for those students from 6 weeks, funded by University resources, to 10 weeks.

11. Some lecturers are giving out additional voluntary research projects for students in order to engage and stretch them. Several students noted that they had been seeking more complex challenges in their education and the Department had been very responsive in meeting such requests through a variety of research projects and other challenging opportunities.
12. All students who interacted with the panel praised the very high standards in Theoretical Physics.
13. The high level of interactivity between students and staff shapes the learning culture very positively. There was a genuine expression of appreciation for the open and positive attitude of all members of faculty towards engaging with undergraduates and PhD students.
14. PhD students in the Department benefit from the supportive environment and excellent research culture, as well as from additional support due to strong links in the local area, e.g. with the Dublin Institute for Advanced Studies.
15. The Department actively supports widening access for students in order to create and maintain an inclusive community.

Governance

16. The leadership style of the Department is very inclusive.
17. Decisions are made transparently.
18. There is strong collective support for decisions and their consequences.
19. There is good information sharing in the Department.
20. The University has supported the upgrade from 0.5 FTE to 1.0 FTE administrative support and has committed to providing 0.2 FTE computer system administration support.
21. The University is committed to regular quality reviews and invests into them, with excellent organisation of the process by the University's Strategy & Quality Office.
22. The University supports the budget autonomy of the Department and puts appropriate trust into the Department's decision making.

Resourcing and Facilities

23. There is very notable visibility of the Department's research at all levels, evident e.g. in the display of undergraduate, doctoral, and faculty research side by side, which fosters an excellent culture of effective research communication to a wide audience.
24. The Department's structures and facilities reinforce its collaborative environment.
25. Collaborative space for students is a priority for the Department.

Staff and staff development

26. The University provides excellent support for administrative staff through the University-wide Departmental Administrators' Forum.
27. The Head of Department is giving excellent support to the administrative member of staff and has substantially contributed to her quick and efficient induction into the working practices of the Department.
28. The University's Centre for Teaching and Learning is offering support to PhD students and staff to further the development of good practice in teaching.

Internal and external engagement

29. The Department runs Particle Physics Master classes for schools, which is an excellent initiative.
30. The Department has worked with its undergraduate students on a poster campaign for recruitment.
31. The Department is actively reaching outside to the national and international research community via a range of local, national, and international networks, e.g. by organising a major conference.
32. One of the Department's staff has a blog that reaches out very widely and is read internationally. This clearly has very high promotional value for Maynooth University as a whole.
33. The Department actively engages in exploring further opportunities for collaboration with related subjects' Departments.
34. The Department engages with stakeholders, i.e. the Irish Centre for High-End Computing.
35. The Department collaborates with the Research Development and the Commercialisation Offices as partners in efforts for various activities.

6.3 Recommendations for Improvement

The Peer Review Group recommends:

Institutional/Strategic Recommendations

Number	Recommendation	Additional PRG Comments
S.1	To systematically review student learning journeys at Faculty level to optimize the provision and student experience.	The multitude of possible paths to a degree makes it difficult to notice and deal with omissions or overlaps. If that huge variety of choice is to be kept then at least the most common paths ought to be mapped and checked for consistency.
S.2	To engage with equality & diversity issues at both Faculty and Departmental level.	The lack of female students and staff is very concerning, and a targeted action plan ought to be developed. One item on such an action plan could be e.g. the creation of a women students' forum to network, support each other, and exchange ideas. Another idea might be, potentially in association with appropriate University offices for Equality and Diversity, to introduce a Women in Science lecture or seminar series that includes a separate presentation in which the speaker recounts her career journey in science and how she managed to overcome challenges.

S.3	For the University to continue with their good practice of providing training for Heads of Departments.	
S.4	For the University to support the change-over of the Department's PC systems from Slackware to an easier-to-maintain Linux distribution like e.g. Ubuntu.	
S.5	For Human Resources and the Department to continue their dialogue on best practice regarding the employment of occasional staff.	
S.6	For the University's Alumni Services to help the Department to keep track of and engage with their alumni.	For example, female alumni could be a great help in supporting the Department's strategy on equality and diversity.

Recommendations to the Department

Number	Recommendation	Additional PRG Comments
U.1	To support the students' learning progress by online programme handbooks or pages.	This is helpful for passing on information not just to students, but also to staff, especially new staff.
U.2	To address the teaching overload by exploring further opportunities of collaboration with related disciplines.	More collaboration with both the Mathematics Department and the Department of Experimental Physics could be mutually beneficial. The panel got the clear impression that the Department has tried collaboration in this direction. A more systematic approach should probably come from the Faculty of Science level.
U.3	To engage with the University's Digital Strategy as appropriate for the discipline.	Most of the Department's teaching uses chalk and blackboard for sound pedagogical reasons, which is good. Nevertheless, the Department should be open-minded about new technology and its use for teaching, especially for large classes. Likewise, it should consider offering blended learning opportunities.
U.4	To engage with the University's IT systems to save time for research and other activities.	The Department spends unnecessary effort on some IT solutions that could easily be adopted from the University's central IT service. For example, there is no need for the Department to run its own mail server provided they could use Linux clients to connect to the University's system via IMAP and SMTP servers.

U.5	To improve the Department's workflow procedures by creating and maintaining a Departmental Administration Handbook.	This can be a digital resource. It should be a reference for staff and would be essential if new staff had to be inducted. It would also prevent issues due to a single point of failure in case of illness or absence of current staff.
U.6	To systematically record workload allocation within the Department.	The transparent recording of workload allocation is not just good practice, but it also facilitates hand-over during changes of leadership and prevents a single point of failure.
U.7	To re-consider the viability of specific programmes, in particular low-recruiting MSc programmes, and potentially discontinue those in favour of more taught elements for PhD students.	The Department excels in the quality of its provision for PhD students and should build on that strength, especially if expected MSc recruitment does not come to pass.
U.8	To continue to engage with the University's Admissions Office for recruitment and outreach, especially with the Science Outreach Officer.	
U.9	To link with Science Education staff in the Department of Education for the purposes of liaison with schools and taking advantage of research into science education and gender equality.	
U.10	To continue their awareness-raising work and to excite passion for their discipline at school level.	